The **F**ire **I**nformation for **R**esource **M**anagement **S**ystem (FIRMS):

Delivering satellite-derived near real-time fire data

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FIRMS

What is FIRMS

- FIRMS provides MODIS active fire and burned area data.

FIRMS website:
http://maps.geog.umd.edu

- Active fire locations are processed by NASA's MODIS Rapid Response System (MRR) using the standard MODIS MOD14/MYD14 Fire and Thermal Anomalies Products. Burned Area is MCD45A1.
- Each active fire location represents the center of a 1 km pixel that the algorithm flags as containing at least one fire.
- FIRMS delivers this data to international users who use it in support of research, operations and management objectives.

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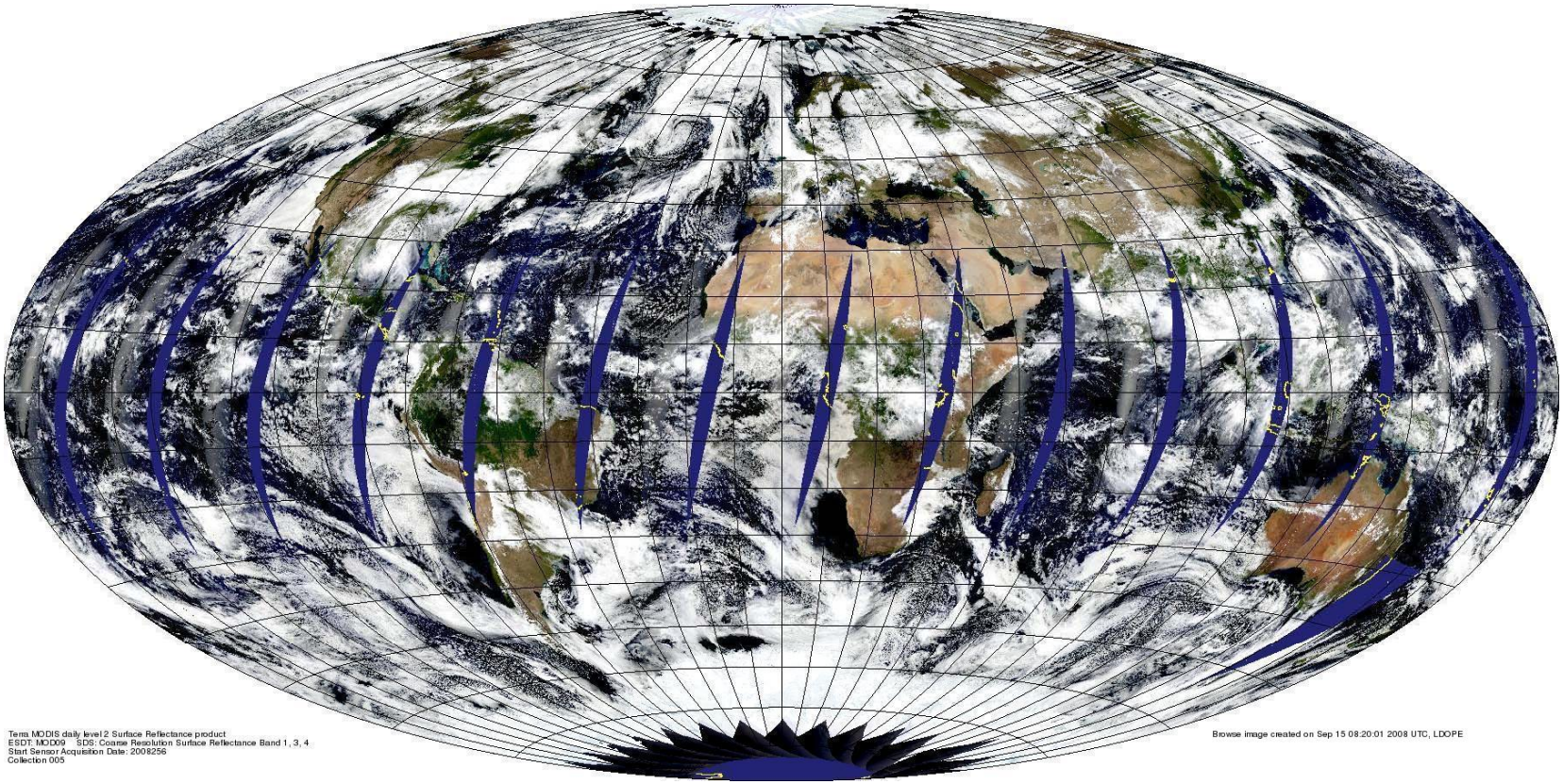
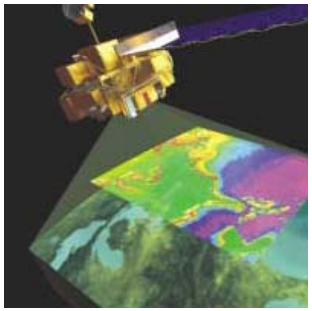
MODIS



- **MOD**erate resolution **I**maging Spectroradiometer
- MODIS is on board 2 polar-orbiting satellites, Terra and Aqua,
- Daily global coverage, most places at least 2 daytime overpasses, many more at high latitudes.
- Fire data products: **Active fire** and **Burned area**

MODIS's continuously rotating scan mirror can make an image of nearly half the continental United States in a single orbital pass. Image credit: NASA-GSFC TV/Susan Byrne, HTSI.



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MODIS fire product range
Active Fire:

- **HDF format data downloaded from NASA-WIST** — https://wist.echo.nasa.gov/api/
  - MOD14/MYD 14 L2: Granule-based, un-projected 5min of data.
  - MOD14A1/MYD14A2 L3: Daily composites, Tiled - 1km pixel.
  - MOD14A2/MYD14A2 L3: 8-day composites, Tiled - 1km pixel.
- **University of Maryland:** — ftp://fuoco.geog.umd.edu (login name is *fire* and password is *burnt*)
  - MODIS Climate Modelling Grid: fire density in either monthly or 8-day Raster grids with .5° lat/long cells[2].
  - MCD14ML Global Monthly Fire Location Product: ASCII text files with fire locations – 1km resolution[2].
- **MODIS Rapid Response:** — http://rapidfire.sci.gsfc.nasa.gov/
  - Georeferenced Jpeg/geotiff imagery with fire mask overlays.[3]
  - ASCII text files of fire locations created in near-real time (approx. 2-4 hrs after overpass). This is what FIRMS utilizes to deliver data.
- **FIRMS:** — http://maps.geog.umd.edu/firms/
  - **User-friendly, smaller files, near-real time push to users.**

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MODIS fire product range
Burned Area

- **HDF format data downloaded from NASA-WIST**
  - MCD45A1 L3: Burned Area Monthly, Global, 500m Sinusoidal.

https://wist.echo.nasa.gov/api/

- **University of Maryland:**
  - MCD45A1 in HDF
  - MCD45A1 in Geotiff
  - Both available through a simplified process on FTP

http://modis-fire.umd.edu/BA_getdata.l

- **FIRMS:**
  - **Currently only for visualization on WebGIS**

http://maps.geog.umd.edu/firms/

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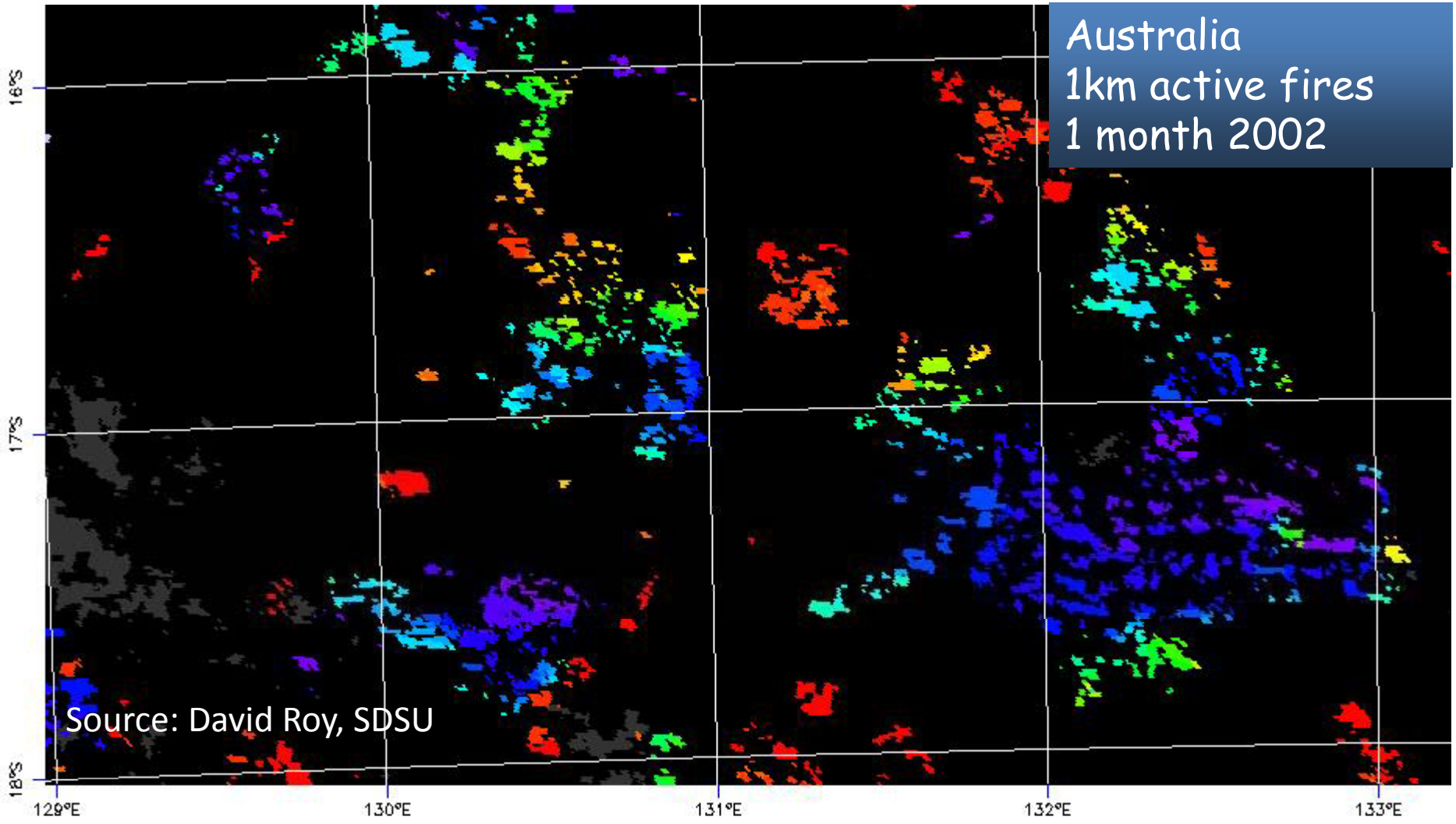
Difference between AF and BA: AF



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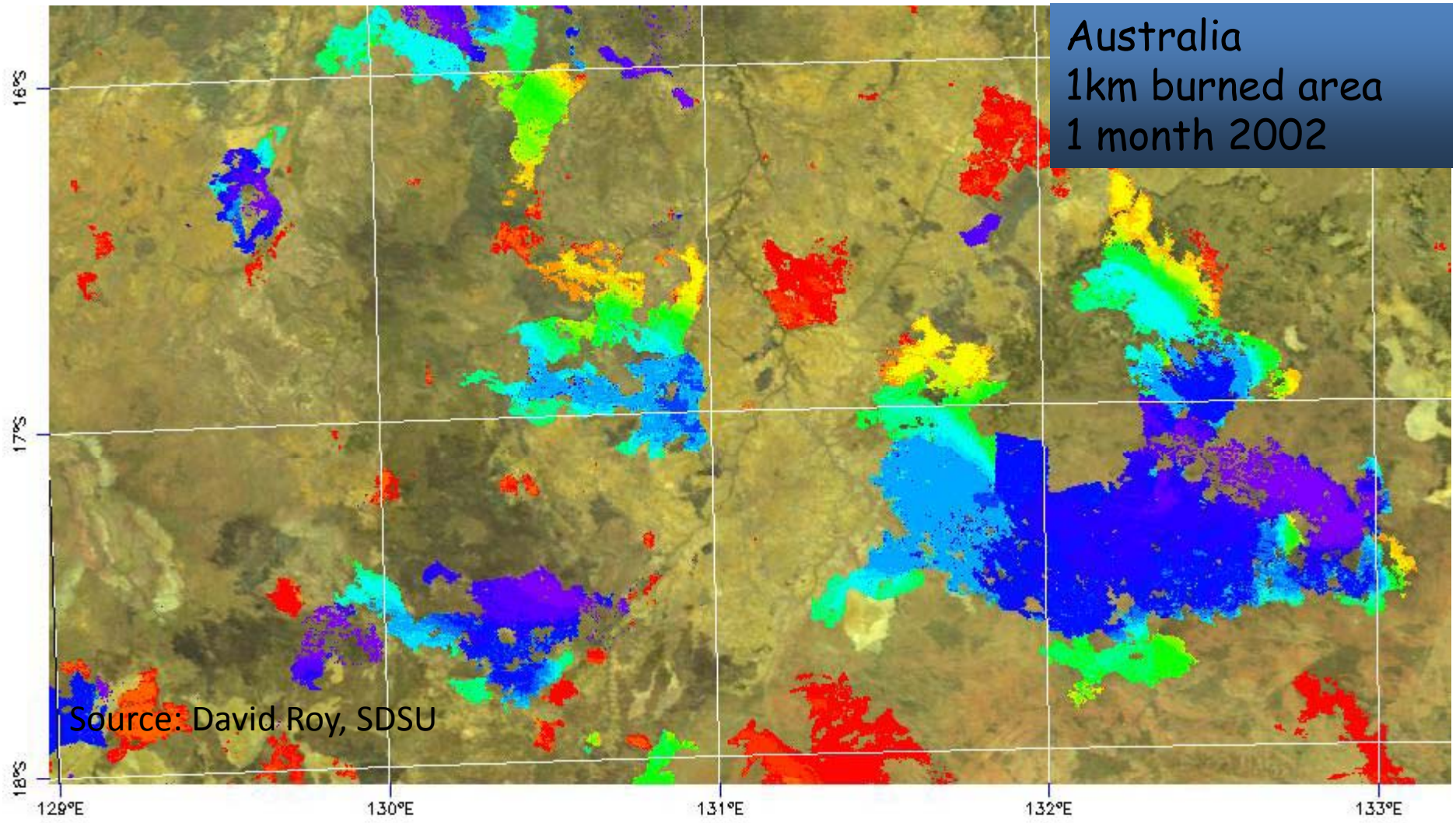
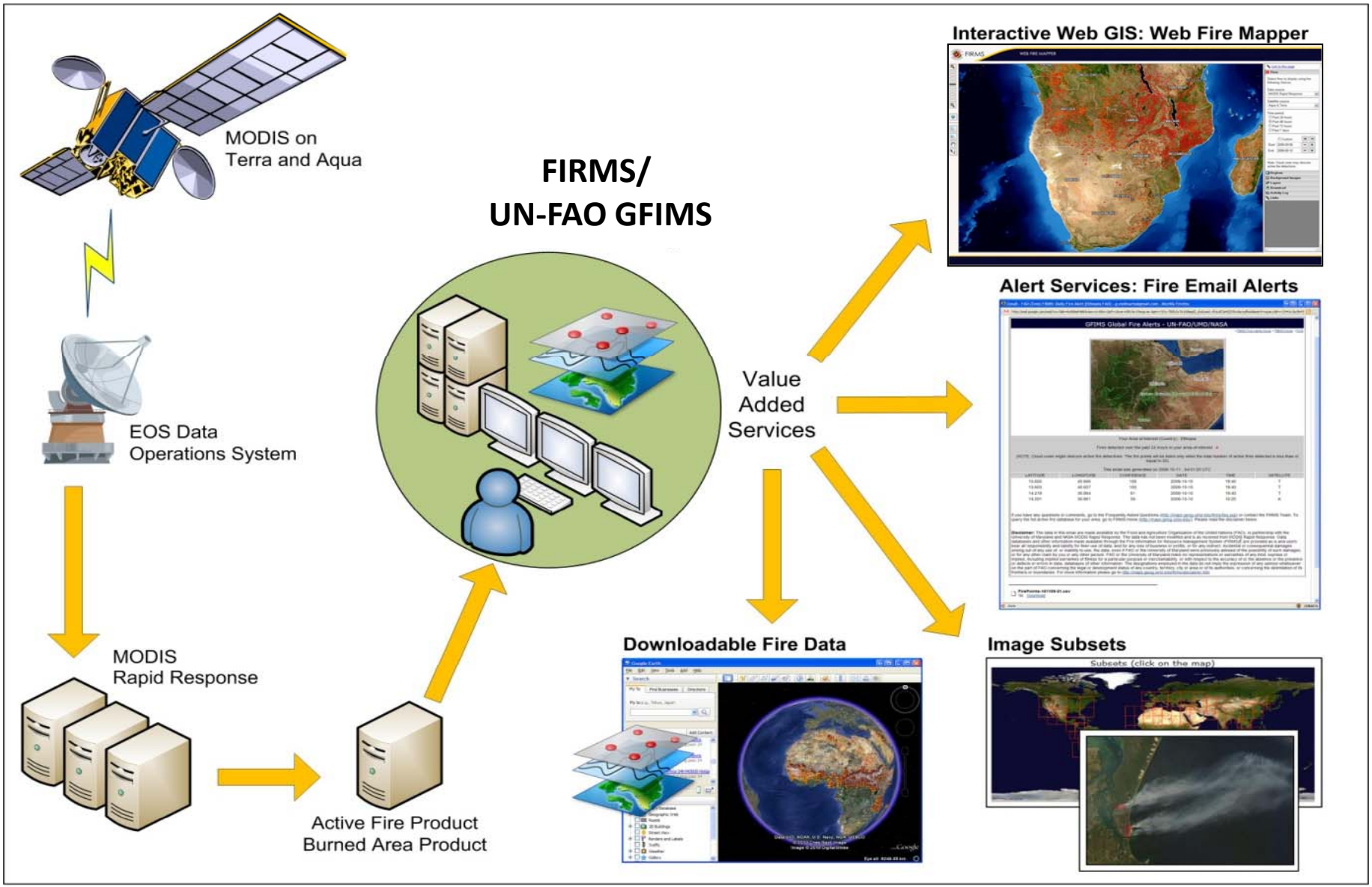
Difference between AF and BA: BA

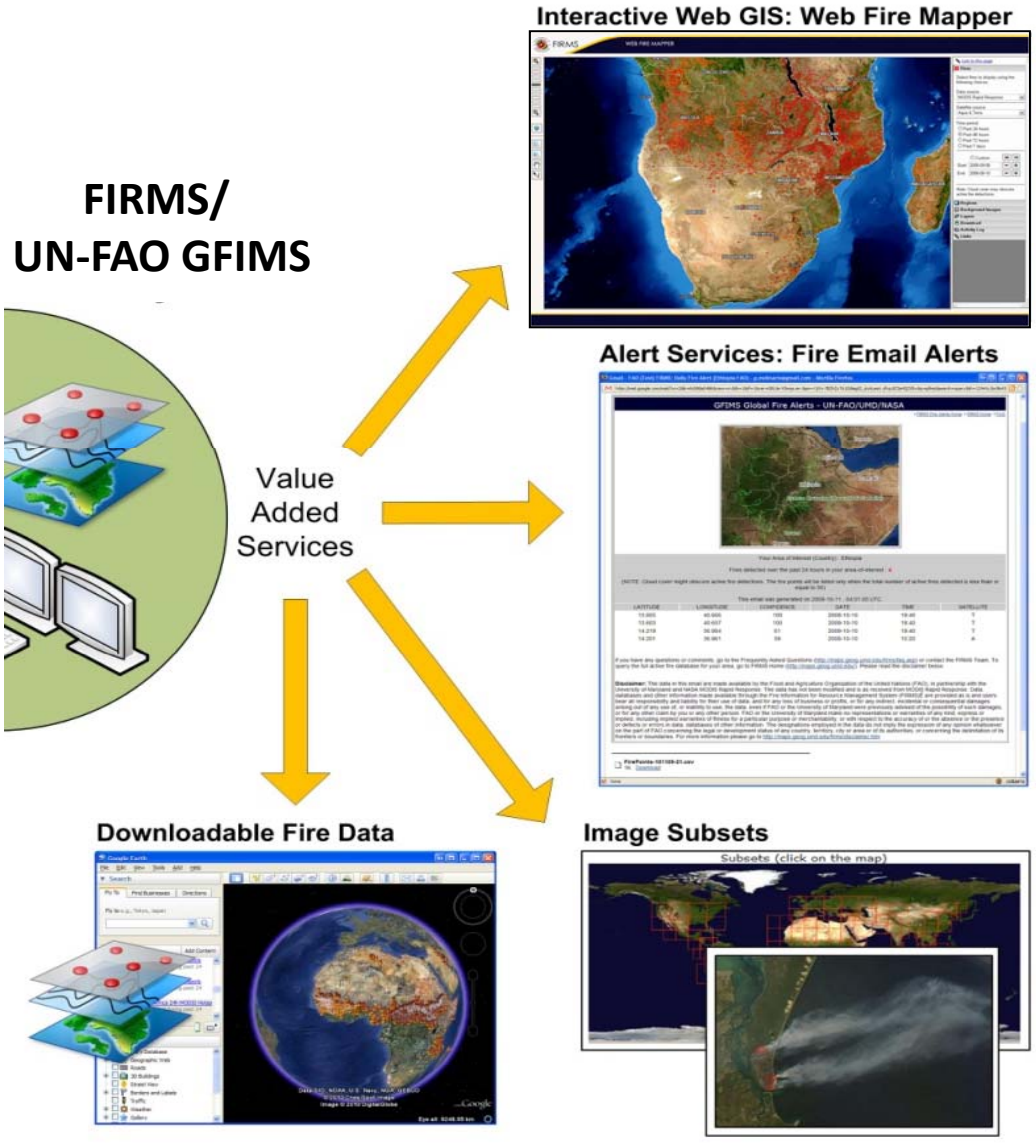


So What data and tools does FIRMS offer?

FIRMS structure



FIRMS structure



- WebGIS (Web Fire Mapper)
- Global Fire Email Alerts
- Fire data downloads
- Subsets of MODIS images

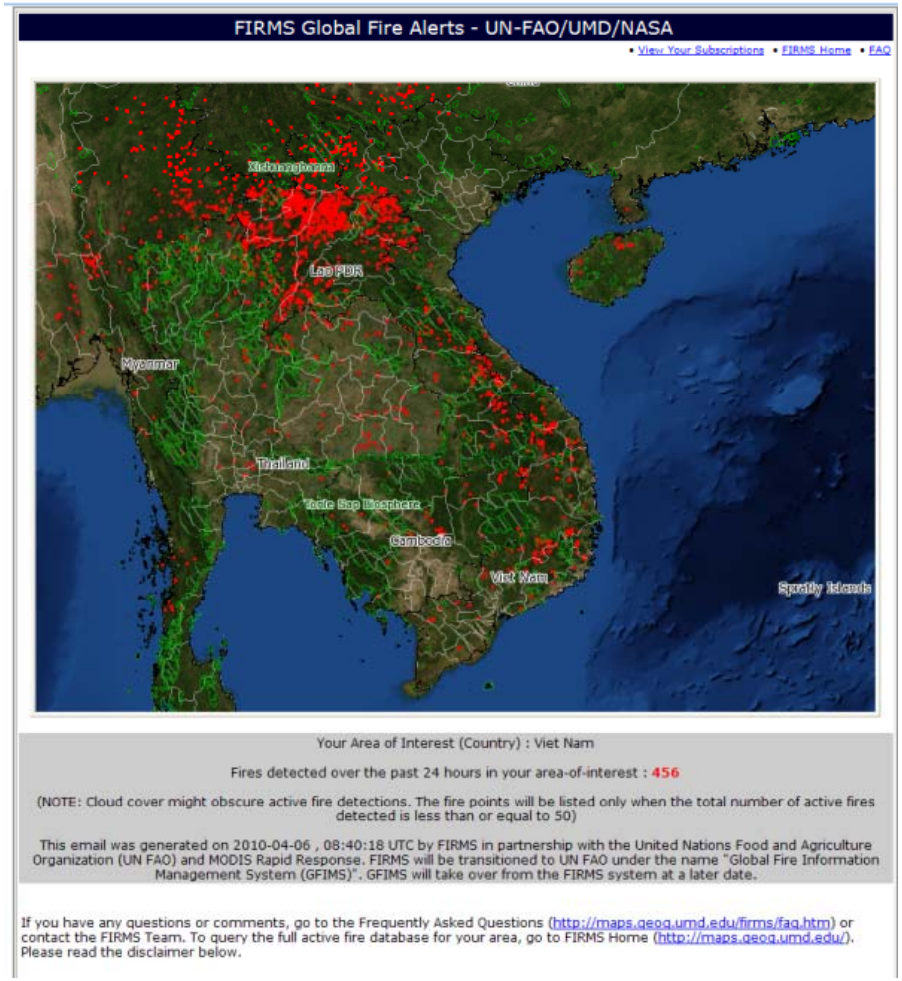
All delivered in near-real time (2 – 4 hours after satellite overpass) or as summaries.

The Web Fire Mapper

Burned Area

MODIS global burned area product available on FIRMS only for visualization

Fire Email Alerts



Sample daily fire email alert for Thailand

- Any user can subscribe online, specifying an area of interest
- Email alerts are sent daily, weekly or in near-real time
- Email alerts provide an image and CSV/text file including latitude/longitude coordinates of the location of fires

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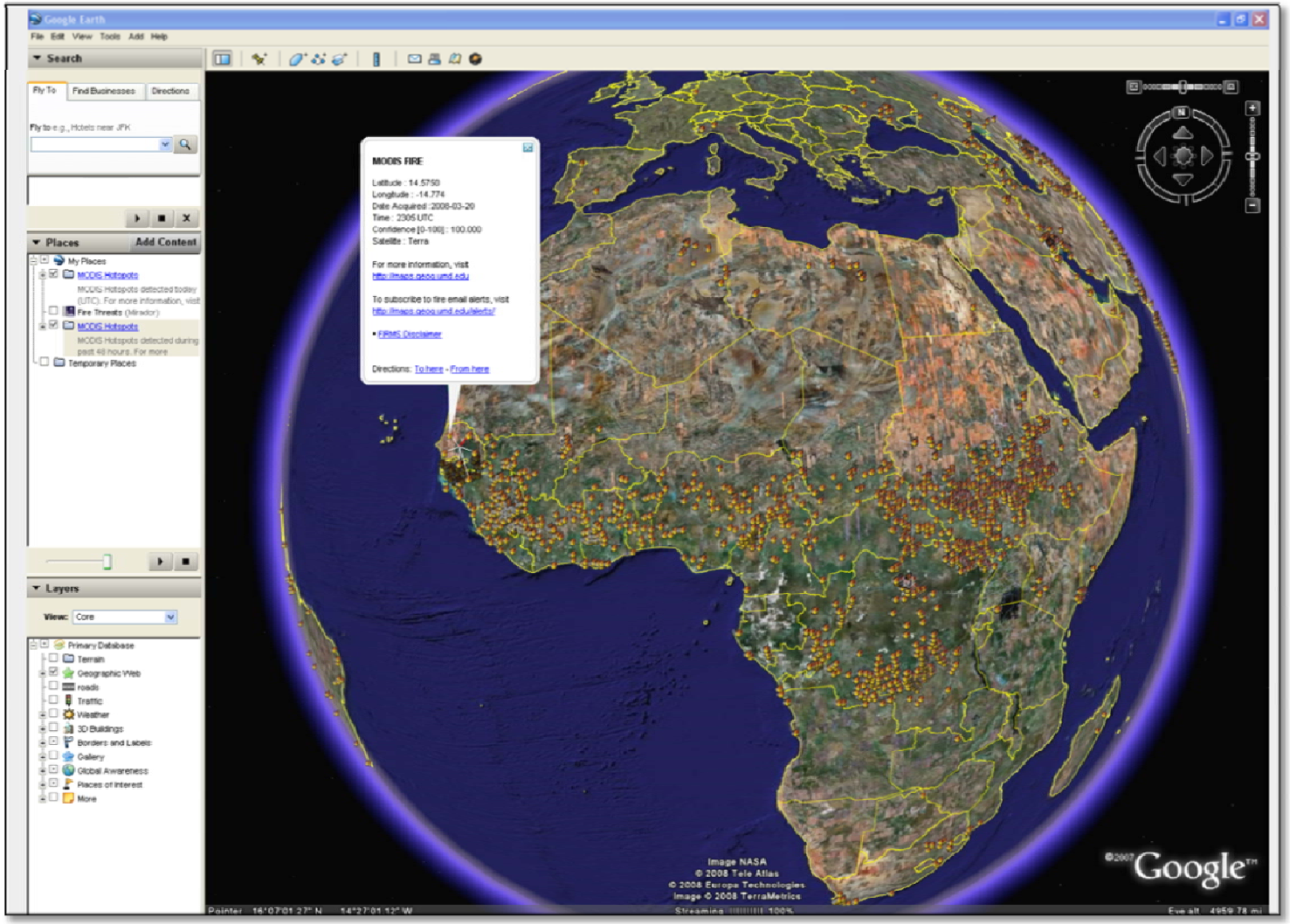
Downloadable fire data: user friendly formats

- KML
- SHP
- CSV/TXT
- WMS
- Archive available on request.



http://maps.geog.umd.edu/firms/firedata.htm

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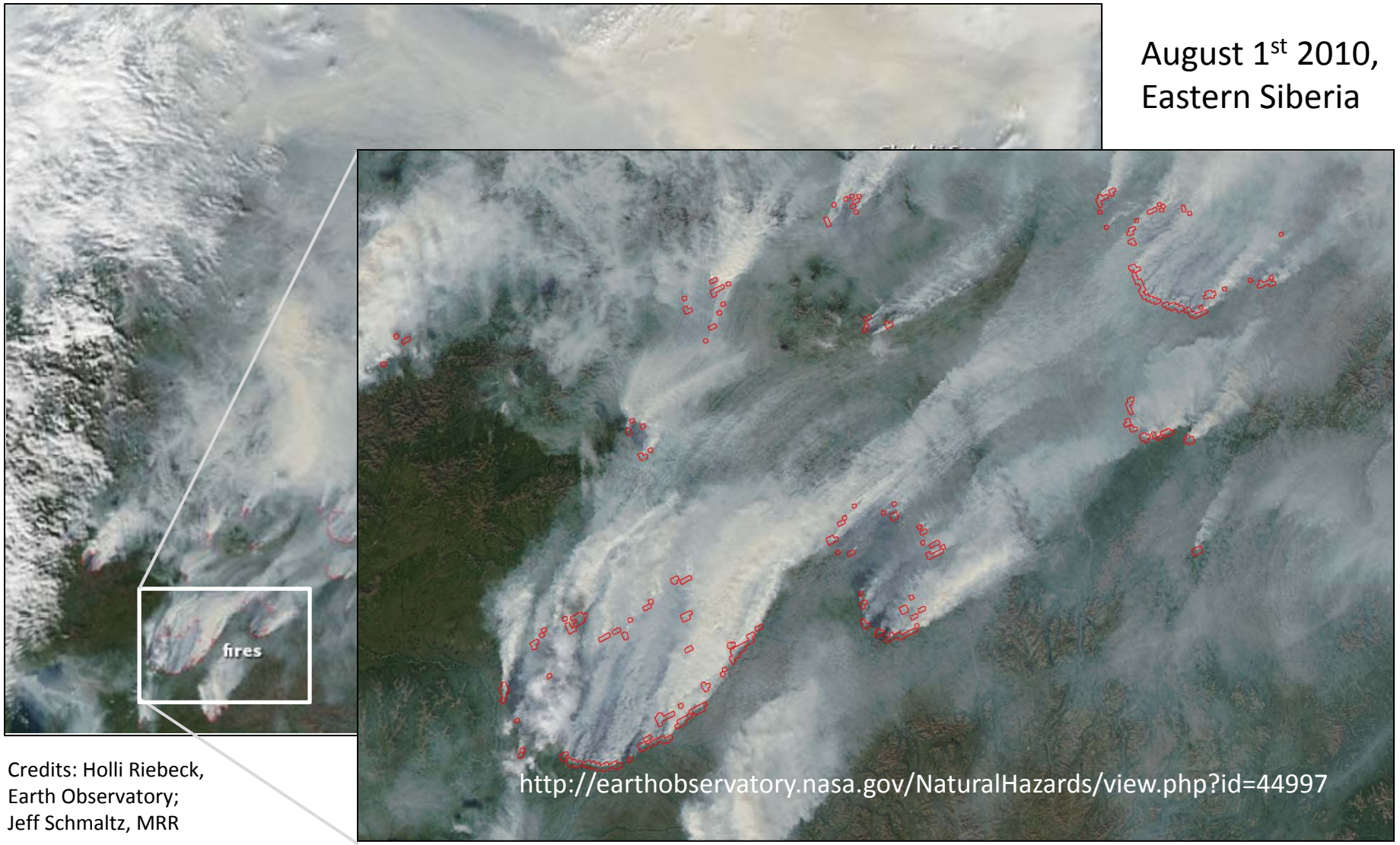
MODIS Rapid Response Subsets

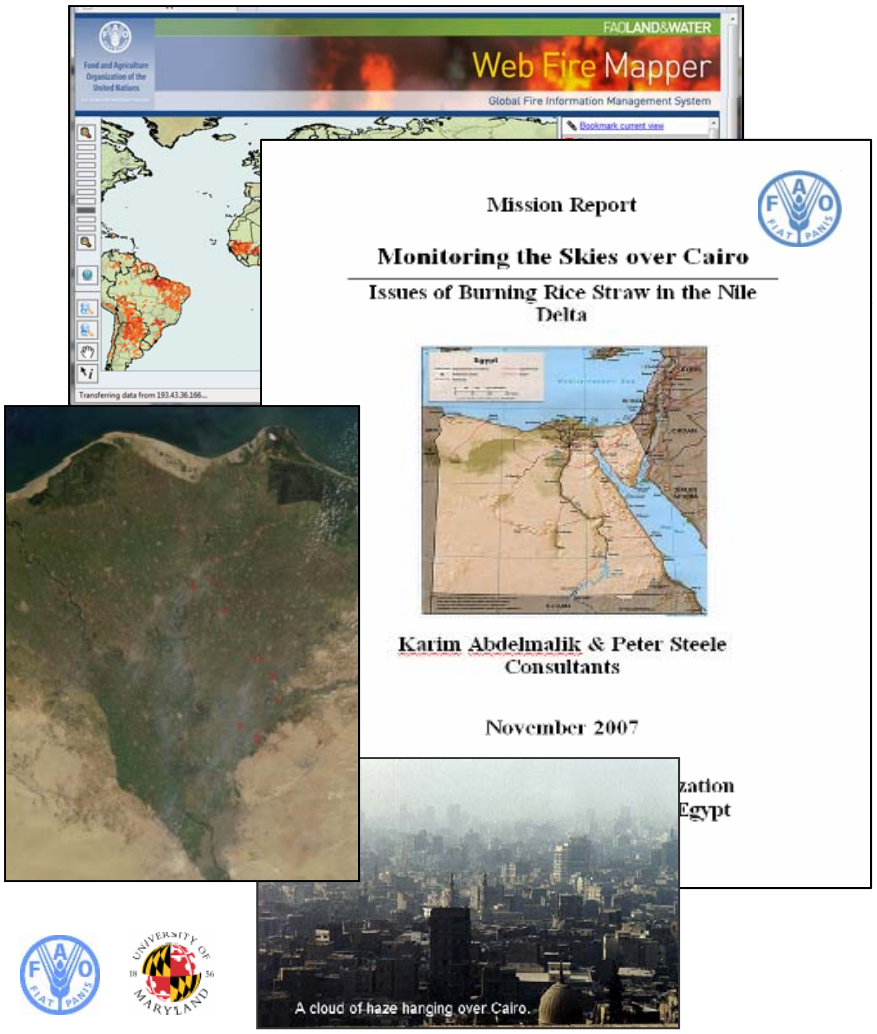
August 1st 2010,
Eastern Siberia



Credits: Holli Riebeck,
Earth Observatory;
Jeff Schmaltz, MRR

Transition a FIRMS system to the UN Food and Agriculture Organization (FAO)

- **Launched in August 2010**.
- At FAO FIRMS is called **Global Fire Information Management System (GFIMS).**
- **FIRMS** will continue to cater to the NASA community; **GFIMS** to the operational/management users.
- Goals: Reaching more users through the UN system, growing functionalities.
- Country fire reports and ad-hoc reports, can help nations that don't have fire monitoring capacity.
- 338 email subscribers already! Large media attention.



How is it being used, how is it helping people?

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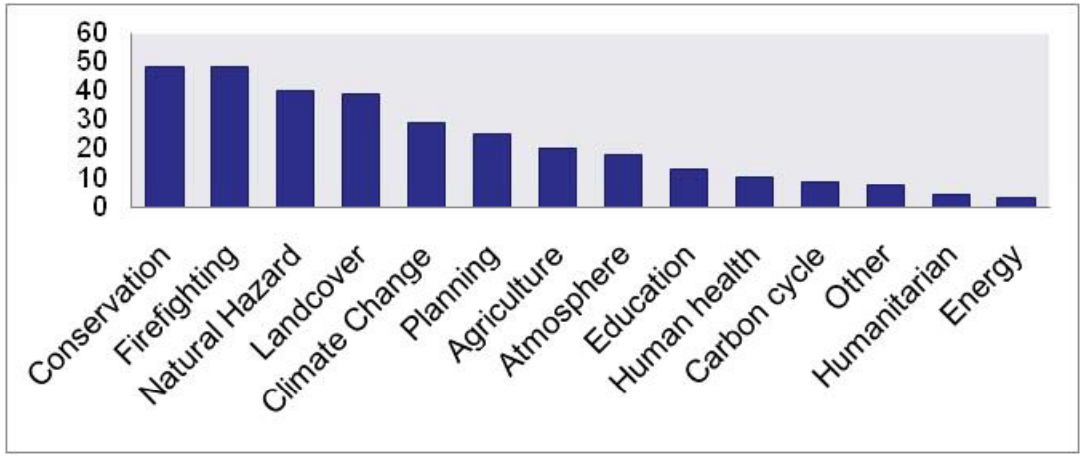
Who are our users?

- Survey completed in April 2009
- Responses from **345** people from **65** countries
- Most users are in **Conservation** and **Firefighting.**



Geographic area of interest:

- **28%** Africa
- **20%** North America
- approx**. 17%** each for Europe, South & East Asia and South & Central America

Most used applications:

Email Alerts ➔ Web Fire Mapper (WebGIS) ➔ MODIS image subsets ➔ KML ➔ FTP access ➔ WMS ➔ NASA World Wind.

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Some FIRMS users

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FIRMS web use during wildfire emergencies

2007 Greece Fires
Peak number of visits on August 27, 2007:
8,168 total visits, 3,937 from Greece

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FIRMS web use during wildfire emergencies

2007 California Fires
Peak number of visits on October 23, 2007:
4,097 total visits, 3,709 from the US

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FIRMS web use during wildfire emergencies

2009 Greece Fires
Peak number of visits on August 23, 2009:
2,417 total visits, 1,817 visits from Greece

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FIRMS web use during wildfire emergencies

2010 Russia Fires
Peak number of visits on August 9, 2010:
29,378 total visits, **24,172** from Russia

During the Russia fires there were record number of visits to FIRMS:

- 29,378 hits on August 9th 2010
- of these 24,172 came from Russia

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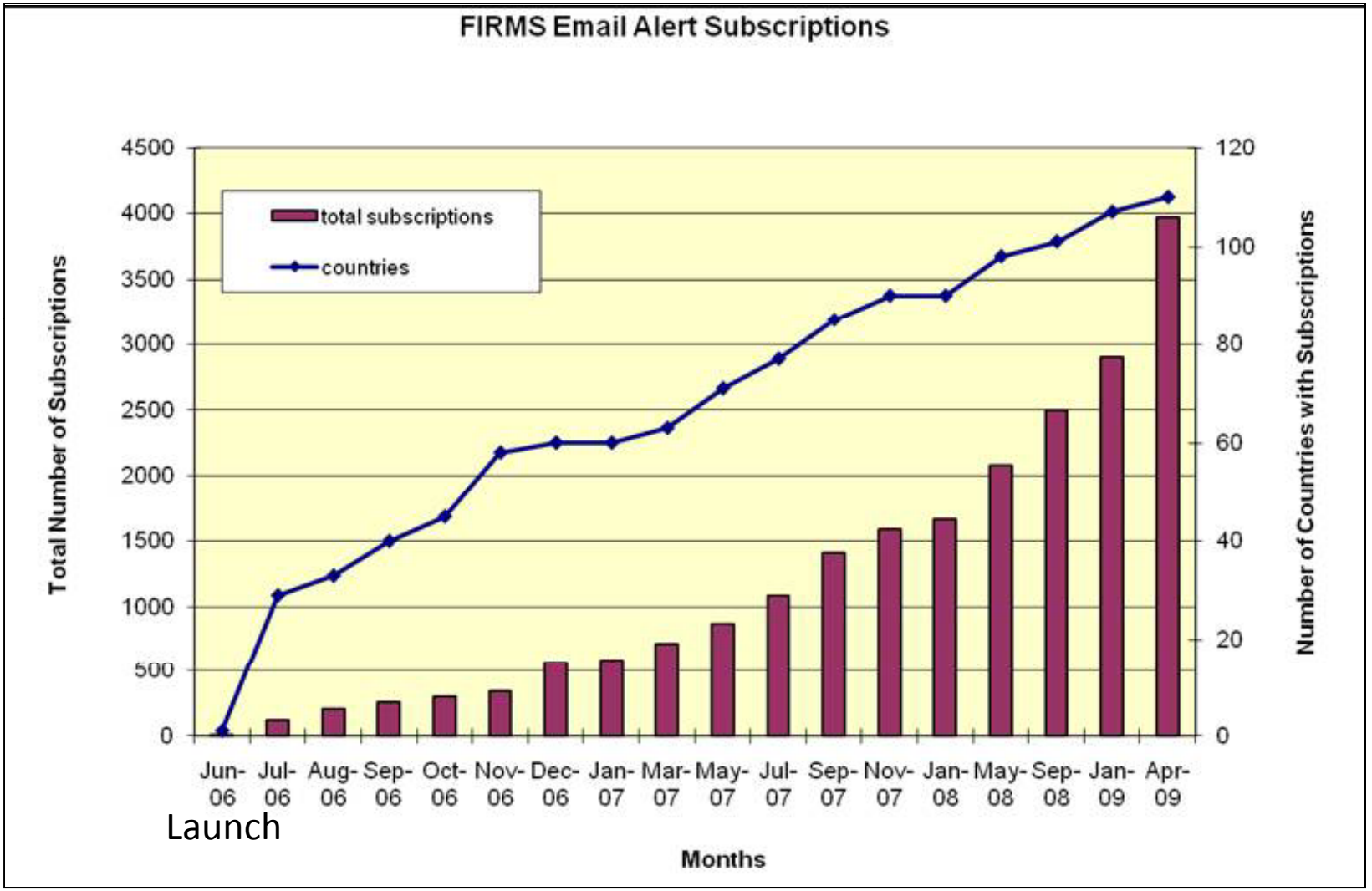
Email Alert Subscription Growth



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In Conclusion:
FIRMS leverages MODIS fire data to provide these benefits:

- **Earlier warnings** of large fires that warrant management response and more accurate fire locations,
- **More comprehensive overviews** of the total fire situation for fire managers, stakeholders on the local, regional and national levels,
- **Greater accessibility** to remote sensing based fire information, used by users in various and diverse fields,
- **A smoother playing field** among government agencies, the private sector, and NGOs because all have access to free, user-friendly, fire information
- **An expanding user base,** through FAO's GFIMS, especially useful for countries with limited capacity to monitor fire through remote sensing.

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Thank You – Questions?

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- Earth Observatory: http://earthobservatory.nasa.gov/NaturalHazards/
- MODIS Rapid Response http://rapidfire.sci.gsfc.nasa.gov/
- GFIMS at FAO: http://www.fao.org/nr/gfims/en/
- MODIS Fire Website: http://modis-fire.umd.edu/index.html
- MODIS Fire User Guide: http://modis-fire.umd.edu/AF_usermanual.html